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10/074,616	02/13/2002	Silvano Gai	112025-0482	7341

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EXAMINER

FILIPCZYK, MARCIN R

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DATE MAILED: 12/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/074,616	Applicant(s) GAI ET AL.	
	Examiner Marc R. Filipczyk	Art Unit 2163	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 August 2005 and 14 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 21-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 21-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/1/05</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

This Action is responsive to Applicant's RCE request and amendment filed on October 14, 2005 and August 12, 2005, respectively.

To expedite the process of examination Examiner requests that all future correspondences in regard to overcoming prior art rejections or other issues (e.g. amendments, 35 U.S.C. 112, objections and the like) set forth by the Examiner that Applicants provide and link to the most specific page and line numbers of the disclosure where the best support is found (see 35 U.S.C. 132).

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 14, 2005 has been entered.

Claims 1-12 and newly submitted claims 26-35 are pending.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-12 and 21-35 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The basis of this rejection is set forth whether the invention is within the technological arts and whether it generates a tangible result.

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For a claimed invention to be statutory, the claimed invention must be within the technological arts. Mere ideas in the abstract (i.e., abstract idea, law of nature, natural phenomena) that do not apply, involve, use, or advance the technological arts fail to promote the “progress of science and the useful arts” (i.e., the physical sciences as opposed to social sciences, for example) and therefore are found to be non-statutory subject matter. For a claim to pass muster, the recited steps must somehow apply, involve, use, or advance the technological arts such as a computer and produce a tangible result. State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02.

In the present case, independent claims 1, 8 and 22 only recite a program per se. A computer program is statutory while being claimed as part of an otherwise statutory manufacture or machine. In such a case, the claim remains statutory irrespective of the fact that a computer program is included in the claim. The same result occurs when a computer program is used in a computerized process where the computer executes the instructions set forth in the computer program. Claims 1, 8 and 22 taken as a whole are directed to a mere program listing, i.e., to only its description or expression, is descriptive material per se and hence nonstatutory. In addition claims 1, 8 and 22 do not produce a useful, concrete and tangible result.

In the present case, independent claims 26 and 31 only recite an abstract idea. Claims 26 and 31 do not state/accomplish a practical application and do not produce a useful, concrete and tangible result, and are hence nonstatutory.

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Since the claimed invention taken as a whole is not within the technological arts as explained above, claims 2-7, 9-12, 21, 23-25, 27-30 and 32-35 which depend from 1, 8, 22, 26 and 32, respectively, are deemed to be directed to non-statutory subject matter.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 and 21-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1, 26 and 31, the segment, “having a corresponding action” is indefinite. It is not clear how a regular expression has a corresponding action, it is further not clear what the corresponding actions are. Second, the phrase, “a given regular expression” is indefinite. It is not clear what regular expression is being referred to. Further, regarding claims 26 and 31, the term “switch” is indefinite. It is not clear what the metes and bounds of switch are. The body of the claim does not support the switch, also, it is not clear if switch as claimed is software, hardware or combination of the two.

Regarding claim 2, the phrase, “the preceding” is indefinite. Although matching characters is clear, the scope of preceding is not clear because the claim does not disclose the starting point of preceding.

Regarding claim 3, the feature of “the step of organizing” is indefinite. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 4, the phrase, “a given section” is indefinite. It is not clear what section is referred to. Second, the segment, “the respective sub-expression” is indefinite. It is not clear what sub-expression is referred to.

Regarding claim 5, the phrase “the section” is indefinite. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 7, the term “TCAM” is indefinite. It is not clear what “T” stands for in the claim. Second, the segment, “loaded as a plurality” is indefinite. It is not clear whether the regular expressions are loaded. Third, the feature of “mismatch pattern having **all** don’t care values” is indefinite. It is not clear how the mismatch pattern includes all don’t care values.

Regarding claim 8, the segment, “having a corresponding action” is indefinite. It is not clear how a regular expression has a corresponding action, it is further not clear what the corresponding actions are. Second, the phrase, “a given regular expression” is indefinite. It is not clear what regular expression is being referred to. Third, the term “the preceding” is indefinite. Although matching characters is clear, the scope of preceding is not clear because the claim does not disclose the starting point of preceding. Fourth, the segment, “the respective sub-expression” is indefinite. It is not clear what sub-expression is referred to. Last, feature of “mismatch pattern including **all** don’t care values” is indefinite. It is not clear how the mismatch pattern includes all don’t care values.

Regarding claim 10, the segment, “the step of loading the entry” is indefinite. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 11, the term “thereby” is indefinite. It is not clear what the metes and bounds of thereby are.

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Regarding claim 22, the segment “having a corresponding action” is indefinite. It is not clear how a regular expression has a corresponding action, it is further not clear what the corresponding actions are. Second, the segment, “further including” is indefinite. It is not clear where the second memory is included.

Regarding claims 2-7, 9-12, 21, 23-25, 27-30 and 32-35 depend from 1, 8, 22, 26 and 32, respectively, contain at least the deficiencies of their parent claims and are rejected to on the same merits.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12, 21-25 and 26-35 are rejected under 35 U.S.C. 103(a) as best as Examiner is able to ascertain as being unpatentable over Fritchman (U.S. Patent No 6,785,677) in view of Sherman (U.S. Patent No. 6,389,507).

Regarding claims 1, 2 and 6, Fritchman discloses a method for programming a pattern matching engine having a plurality of information storage entries with one or more regular expressions (fig. 2, block 20), each regular expression including a plurality of characters and having a corresponding action to be applied to matching strings, the method comprising the steps of:

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identifying one or more borders within a given regular expression, the one or more borders separating the given regular expression into a plurality of sub-expressions, at least one sub-expression having a plurality of sequential characters (figs. 3A-3C); and

loading one or more entries of the pattern matching engine with a plurality of the sequential characters from at least one sub-expression, (fig. 2, block 21, PATTERN; *preprocessing pattern string*); wherein

the borders are defined by a predetermined sequence of regular expression metacharacters, the metacharacters being wildcards (col. 7, Table; “_” and “%”, Fritchman), but does not expressly teach that the search engine has a content addressable memory (CAM).

Sherman teaches a search engine using a ternary CAM to store data for pattern matching (abstract and fig. 3, Sherman). One of the benefits of a CAM is allowing program access to and from the memory (CAM). Note, Fritchman uses a program to access the memory system's content (abstract, Fritchman). Hence, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to store Fritchman's data in a CAM since Fritchman's memory system supports and enables program interaction (abstract, Fritchman). One would have been motivated to combine the two pattern matching systems because both systems are compatible by supporting program access to memory and Fritchman system would benefit from the format advantages of using a ternary CAM.

Regarding claim 3, Fritchman/Sherman disclose organizing at least part of the pattern matching engine into a plurality of sections, and wherein each section of the pattern matching

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engine is loaded with a plurality of search patterns for a corresponding sub-expression (fig. 2, block 21 and figs. 3A-3C, Fritchman).

Regarding claim 4, Fritchman/Sherman disclose one of the search patterns includes a complete match of the respective sub-expression, a search pattern that includes a partial match of the respective sub-expression, and a mismatch pattern (fig. 2, block 22, Fritchman).

(Note: each pattern has a complete match, partial match and mismatch depending on the target string)

Regarding claim 5, Fritchman/Sherman disclose associating at least one sub-expression with a current variable (figs. 4A-4C, Fritchman); and

loading the associated current state variable into each entry of the section of the pattern matching engine that contains the at least one sub-expression (fig. 2, blocks 22 and 23; TARGET *matched strings*, and figs. 4A-4C, Fritchman) .

Regarding claim 7, Fritchman/Sherman teach the CAM is a ternary CAM (fig. 3, Sherman) that supports don't care values (col. 7, table; *wildcards*, Fritchman), and

the mismatch pattern includes don't care values (fig. 2, block 22, TARGET; values RS, Fritchman).

Regarding claim 21, Fritchman/Sherman disclose the regular expression is associated with an action (fig. 2, prefix, suffix, Fritchman),

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pattern matching engine (fig. 3 and col. 6, lines 27-46, Sherman) including at least a first and second memory (fig. 3, *TCAM* and *SRAM* and *DCAM*, Sherman) with entries, and that the second memory's entries are loaded with actions (fig. 3, *associated data*, Sherman) associated with one regular expression.

Regarding claims 8-12 and 22-35, they comprise the same subject matter as claims 1-7 and 21 rejected above, and are therefore rejected on the same merits.

Response to Arguments

Applicant's arguments filed August 12, 2005 have been fully considered but they are not persuasive. The arguments and responses are listed below.

Applicant argues on page 11 of the 8/12/05 response that the submitted amendment is believed to have overcome objections.

Examiner disagrees. Applicant has not addressed all the issues raised by the office and therefore has not overcome previous objections and rejections. In addition, after careful consideration of the amendment and review of all the pending claims, it is not clear what if any subject matter comprises novelty and practical utility, hence, the office raises additional rejections. As such, previous indication of allowable subject matter is withdrawn.

Applicant argues on pages 12-14 of the 8/12/05 response that Fritchman does not teach loading of characters from sub-expressions into the entries of a pattern matching engine... the entries stored in content addressable memory.

Examiner disagrees. Fritchman discloses loading characters from sub-expressions into the entries of a pattern matching engine to perform a sequential match illustrated in fig. 2, items 20, 21 and 22. Examiner points the Applicant's attention for a relevant definition of "load" to Microsoft Computer Dictionary, Fifth Edition: **load – to place information from storage into memory for processing, if it is data, or for execution, if it is program code.**

Clearly it is not necessary for Fritchman to use the term "load" since he clearly uses information from memory for processing. In addition, Fritchman in view of Sherman teach entries are stored in ternary content addressable memory (abstract and fig. 3, Sherman).

For more information please refer to the rejections above.

With respect to all the pending claims 1-12 and 21-35, Examiner respectfully traverses Applicant's assertion based on the discussion and rejection cited above.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc R. Filipczyk whose telephone number is (571) 272-4019. The examiner can normally be reached on Mon-Fri, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on (571) 272-4023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MF
December 12, 2005


FRANTZ COBY
PRIMARY EXAMINER